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No. 106

Postgraduate Medical Education and the Specialties

With special reference to the problem
in London

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BRITISH
MEDICAL

Members of the Reporting Committee

Sir George Pickering, Regius Professor of Medicine, University of Oxford (Chairman).

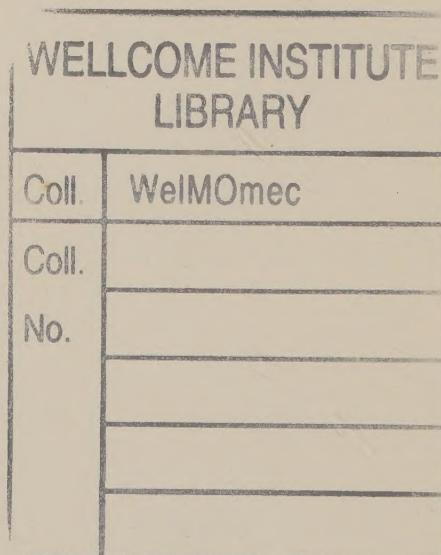
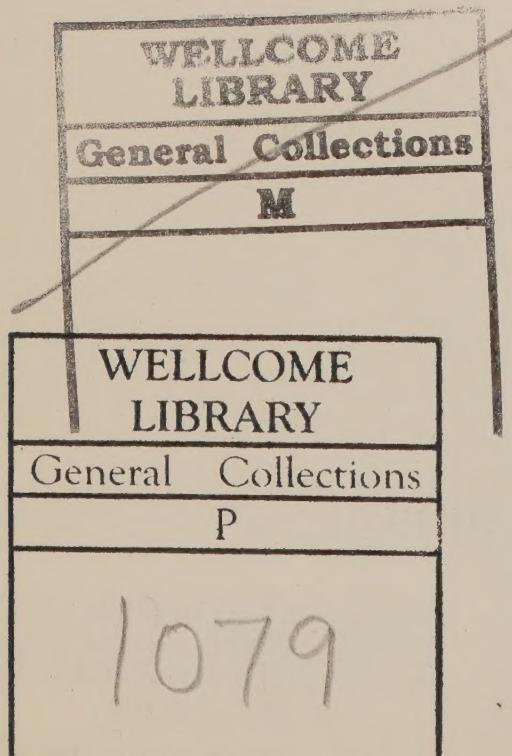
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FOREWORD

The postgraduate teaching hospitals and their institutes in London are dispersed on many sites, some of which are far too small. Many of the buildings are old and in need of replacement and it was therefore decided that as they were rebuilt an attempt should be made to group them in a way in which they might provide mutual support. The Minister of Health's announcement in the House of Commons on 27th June, 1961, quoted at the beginning of this report, sets out the plan.

It was thought that it would be useful to have the views of an independent small committee of experienced medical teachers on the way in which grouping could be made to yield the greatest advantages to the individual hospitals and institutes. In consultation with the Ministry of Health, the University Grants Committee therefore invited Sir George Pickering to Chair a small committee to review the principles involved.

The report of this Committee is being made available to the Boards of Governors and the Institutes concerned, but it seemed to be of such general interest as to merit greater circulation. The further development of postgraduate medical education appears to be imminent not only in this country but also overseas, and it was thought that many of the principles which this report outlines for the establishment of common services among specialist fields might be widely applicable.

The University Grants Committee and the Ministry of Health are greatly indebted to the Members of the Committee for having undertaken an onerous task ; completed it in a very short time; and produced a report of such value and general interest.

KEITH MURRAY,
Chairman, University Grants Committee.

G. E. GODBER,
Chief Medical Officer.

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TERMS OF REFERENCE

On the 27th June, 1961, the Minister of Health made the following statement in the House of Commons :—

“Following consultations with the University of London, the British Post-graduate Medical Federation and the University Grants Committee, I have agreed in principle that in the interests of teaching and research and of the hospital service generally the special postgraduate hospitals and institutes should as far as possible be brought together in two groups for which the nuclei already exist.

“Accordingly, I am proposing that the National Hospital for Nervous Diseases, the Hospital for Sick Children, the Royal National Throat, Nose and Ear Hospital and the Eastman Dental Hospital shall remain or be developed with their institutes on their present sites in the Holborn area; and the two branches of Moorfields Eye Hospital and the Institute of Ophthalmology will in due course be brought together and developed on the site of the Royal Free Hospital in Gray’s Inn Road.

“As regards the other group, I am proposing that the Brompton Hospital (with which the London Chest Hospital is to be combined) and the Royal Marsden Hospital will remain and be developed with their respective institutes in their present locations on the Fulham Road. With them will be located the following smaller hospitals, with their institutes, as and when they are rebuilt: St. Peter’s, St. Paul’s and St. Philip’s Hospitals; St. John’s Hospital for Diseases of the Skin and also St. Mark’s Hospital. Provision will be made for the eventual inclusion of the National Heart Hospital and the Institute of Cardiology. I am still considering the best arrangements to make for the Town branches of the Royal National Orthopaedic Hospital and its institute.

“Because of their special circumstances, I have agreed that Queen Charlotte’s Maternity Hospital and the Bethlem and Maudsley Hospitals, with their respective institutes, need not be moved into either of the two groups. Apart from the transfer of St. Mark’s Hospital, the proposals do not affect Hammersmith Hospital nor the Postgraduate Medical School associated with it.

“The proposals involve redevelopment of the sites now occupied by the Chelsea Hospital for Women and St. Luke’s Hospital. The Chelsea Hospital for Women will be rebuilt adjacent to Queen Charlotte’s. St. Luke’s Hospital urgently needs to be replaced, and I am satisfied that satisfactory alternative geriatric provision can be made for the area; specific proposals will emerge from consideration of the 10-year plan for the South West Metropolitan Region”.

These proposals raised certain general principles of the organization of postgraduate institutes and departments on the University side. The Committee was therefore called together by the University Grants Committee and the Ministry of Health with the following terms of reference :—

“To consider in principle and advise on the advantages which can be secured from the proposed grouping of postgraduate institutes and hospitals, and their joint use of facilities”.

I

HISTORICAL BACKGROUND

SPECIAL HOSPITALS:

In most of the large cities of England and Scotland, general hospitals were established by local philanthropy in the eighteenth century, though some—notably St. Bartholomew's and St. Thomas' in London—were founded very much earlier, as were some of the hospitals for pilgrims and others elsewhere. Hospitals for special diseases were mostly established in the largest cities in the nineteenth century to satisfy a need that remained despite the provision made by the general hospitals. Again, these special hospitals had their prototypes in the leper hospitals of mediaeval times, and again one of these ancient specialised hospitals—Bethlem—persists in the Postgraduate Medical Federation of the University of London. Though some of the special hospitals of the nineteenth century were primarily designed to segregate the sick and were therefore sited in the country like the fever hospitals and asylums, some were primarily for treatment and were therefore sited in the middle of the cities, like the hospitals for women, for children and for diseases of the eye.

In the provinces, where there was only one medical school per city, the special hospitals and the general hospital early formed a *modus operandi* by which diseases of women, of children and of the eye were mostly, or exclusively, handled by the appropriate special hospital. In London, however, with its twelve medical schools the special hospitals undertook no undergraduate teaching. They remained entirely separate from the general hospitals, whose specialist staff competed against each other for the distinction and privilege of being also on the staff of the special hospital.

Because of these peculiar circumstances and the size and position of London as a centre of an empire—later of a commonwealth—the special hospitals in London came to occupy a position of great distinction, privilege and opportunity in their particular fields. Their staffs were, as it were, the quintessence of their specialty; they were not only good enough to get on the staff of a teaching hospital, but they were favoured above their colleagues at other teaching hospitals by also being “on” at their particular special hospital. If a young man wanted to train himself for a specialty, a period of residence in junior and senior posts at the appropriate special hospital became most desirable and therefore sought. Courses of instruction for those who were less fortunate, or who could not afford the time, followed. Thus, when the Ministry of Health became the owner of the hospitals, and the University of the attached medical schools, there were in London thirteen special hospitals, or groups of special hospitals, all undertaking postgraduate teaching in some form. Because of this teaching function, and as they became more organized and improved, the special hospitals came to house thirteen Institutes of the British Postgraduate Medical Federation of the University of London. The others are the Postgraduate Medical School of London at Hammersmith Hospital and the Institute of Basic Medical Sciences at the Royal College of Surgeons.

SPECIAL UNITS :

A second type of organization for the treatment of special types of disease was the specialised unit placed within an existing hospital. The development of such units received an important stimulus from the circumstances of the 1939-45 war. Because large numbers of air raid casualties were foreseen, and because the specialist had developed skills that his more general colleagues had not, units for the diagnosis and treatment of diseases and injuries affecting certain tissues or parts of the body were formed, mostly in general hospitals in the country. Thus were formed units for neurosurgery, for chest surgery, for plastic surgery, for facio-maxillary surgery, for burns and for spinal injuries. These centres had an independent staff of surgeons and physicians selected often from several other general and special hospitals; they had their own wards and often operating theatres. Usually they were served by the radiologists and pathologists who were also providing for the general needs of the parent hospital.

THE TWO PATTERNS OF MEETING SPECIALIST NEEDS :

Thus, we see that two patterns of meeting specialist needs have evolved. The first, that of special hospitals, which originated in the age of private philanthropy ; at that time the chief advances in medicine were being made by accurate description of maladies and their differentiation—by clinical observation rather than laboratory studies and experimental research. The second, that of special units in general hospitals, belongs to an age of state medicine, beginning with the Emergency Medical Service and continuing with the National Health Service ; in this age it has become increasingly important and difficult for clinicians to be familiar with the general advance of science and to secure the collaboration in other disciplines.

II

THE ISSUE

Which of these two contrasting and evolving patterns, or what modification of them, is likely to form the most suitable basis for meeting the needs of specialist medicine in the future ? Or is neither satisfactory ? This, as we see it, bears directly on the question that we have to answer. The Ministerial decision which was the immediate occasion of our appointment makes it possible for an Institute attached to the relevant special hospital to work alone or in conjunction with other Institutes.

Similar problems, though on a smaller scale, are found in other large cities. Specialist services will need to be provided in the future. On what principle, or principles, should action be based ?

PROCEDURE :

It seemed to us that those working in the Postgraduate Institutes and special hospitals forming the two proposed groups would have given thought to the advantages, disadvantages and difficulties of isolation and grouping. We therefore visited these Institutes very briefly in the company of the Director of the British Postgraduate Medical Federation, Sir James Paterson Ross, and the deputy clerk of the Court of the University of London, Mr. Hutchings. We met the Dean, the Director or Professor and the Pathologist and, in some instances, other members of the staff. From these informal visits we appreciated more vividly the issues involved and we would wish to express our gratitude for the courtesy and hospitality of our hosts.

TWO POINTS OF VIEW :

In general, we found two different attitudes, both of which are readily understandable. The first was :—

“We want to stay where we are and develop as we have done. We understand the perils of isolation. But our consultant staff are all attached to general hospitals and we encourage our research staff to travel to appropriate centres to learn new techniques and bring them back here to use them. Most important of all, we are in the middle of a process of developing into a proper university institution. Threaten to move us and this development will stop”.

The second was :—

“We feel cut off from general medicine and surgery, and particularly from the basic sciences. Medicine is now advancing on a broad front, and isolation means being left behind. Moreover, we need the kind of technical facilities that can only reasonably be provided for an organization that is bigger than we are, or are likely to be”.

These two opinions were especially valuable to us since they sharpened the issues which we had already discussed amongst ourselves. We propose to begin by setting out as we understand them, and as they have been explained to us, the rewards and perils of isolation. Then we propose to outline some ideal solutions. Finally, we shall consider how far the actualities are likely to interfere with the ideal, and look briefly into the future.

The Rewards of Isolation

The rewards of isolation are clearly displayed by the past experience of the special hospitals of London. In each there met, competed and collaborated with each other the leading practitioners in a particular field of medicine from the largest city in the world. Each offered the greatest accumulation of knowledge, experience and skill concerning a certain group of diseases. No question here of being displaced in precedence by another speciality, because by definition there could be no other. Where in the world could a better training be got in that particular speciality, and where else could a patient presenting a difficult diagnostic problem be sent with the same assurance that the disease would be known there if it were known at all ?

With few exceptions, staff and students did not feel isolated. The members of the senior or consultant staff all, or nearly all, had additional appointments at general, usually teaching, hospitals where they could consult or work with colleagues both in other branches and in the preclinical sciences. The students and trainees were seldom retained for more than two or three years; their stay in the special hospital was a brief and instructive interlude in a life in which the wider medical contacts came as a matter of course.

Perhaps the most important reward of isolation was the *esprit de corps* generated amongst a *corps d'élite*, all masters, or striving to become masters, of their subject and small enough to have this corporate spirit. Small size brought another advantage—accessibility. It was very easy to visit the laboratory or a colleague in a neighbouring ward, or to look up a journal in the library because it was so close.

There was considerable apprehension amongst the staffs of the Institutes we visited lest these advantages be lost. The fears expressed to us were as follows:—

- (a) That the specialty so patiently cultivated and brought to its present state of excellence should be lost or submerged by the incorporation of a special hospital or institute in a general hospital, or in an aggregation of hospitals or institutes.
- (b) That because of this loss of identity, patients with obscure diseases, visitors in that specialty from abroad, and the best type of post-graduate student would no longer come.
- (c) That the *esprit de corps* would be lost.
- (d) That the amalgamation of Institutes would reach a size such that few people would know everybody else; the staff and student bodies would break into small groups or cliques, and intellectual isolation, far from being eliminated, would become the solace of those who wished to hide from themselves their anonymity imposed by the vastness of the crowd. The fear is a real one, and is the same which impels some to seek the smaller colleges of Oxford and Cambridge and the smaller medical schools in London.

All these fears we understand and value. Nevertheless, we must make this comment. Many of these advantages belong to the past, the penalties more to the present and the future. It will be our special task to see if and how the penalties of isolation can be removed without loss.

The Penalties of Isolation

When the functions of specialist hospitals were limited to the practical handling of special diseases, their isolation from one another and from the rest of medicine may have been an asset rather than a liability. The consultant and his trainee assistants became extremely skilled in a narrow range of skills. If a man wanted to learn the technique and results of cystoscopy, where better than St. Peter's and St. Paul's ? As has been noted, the consultant had an additional appointment at a general hospital and the assistant's stay was only a brief interlude in a series of more general appointments.

The increasingly rapid development of medical knowledge in the last quarter century has made this isolation less comfortable, for medicine advances not on a narrow but on a broad front. For example, an uncommon nervous disease (Wilson's Disease) described from Queen Square is now known to be a manifestation of a specific biochemical fault involving copper-containing protein in the blood. The problem now is not, one merely of diagnosis, but of exploring the nature of the biochemical fault and its treatment. The growing point of knowledge has moved from the neurological physician to the biochemist and geneticist, and the paediatrician rather than the neurologist is now most involved in trying to prevent the manifestations of this kind of disease.

The real dangers of isolation are revealed by the Institutes. These have the additional function of advancing knowledge and of training men to advance knowledge. Nowadays, leadership in medicine is increasingly linked to progressive thought and thus to a habit of mind which is most easily got by exploring the fringes of knowledge. The institutes themselves tend to be increasingly staffed by men who spend the whole of their lives within their walls; Ph.D. students spend upwards of two years there.

Some of the penalties of isolation which these men experience are as follows:—

(a) *Intellectual isolation* : This, the greatest penalty, is what Universities from their foundation have sought to avoid. Dangerous to science in general, it is even more dangerous to medicine which, benefiting from the remarkable advances in the basic sciences, has undergone drastic revision in the last quarter century. Being out of contact with these developments not only makes a man outmoded in his knowledge and outlook ; it also makes him rigid and intolerant and out of sympathy with his more progressive colleagues.

In this connection it is interesting to note that the major advances in the specialties in the last quarter century have not, in the main, come from these special hospitals. Thus, the surgical approach to diseases of the central nervous system and of the cardiovascular system developed chiefly elsewhere.

Intellectual isolation is felt most keenly in the separation of the specialties from general science on the one hand and general medicine and surgery on the other.

(i) *General science* : It is impossible nowadays to advance into the unknown part of the world of disease without some knowledge of those sciences which deal with the elementary behaviour of inanimate (physics and chemistry) and animate (physiology and biochemistry) matter. Cell behaviour, particularly the transmission of genetic information (cytology and genetics) and the problems of measurement in living creatures (biometry) are other disciplines which from time to time are concerned. The smaller institutes are notably lacking in such contacts and facilities, and must remain so as long as they live in isolation.

(ii) *General medicine and surgery* : Similarly, a few diseases are entirely confined to one organ. While a special hospital provides the richest collection of certain kinds of cases and of expertise over a limited range, the canvas tends to be incomplete. Certain types of case are lacking and only to be encountered in general hospitals admitting the acute sick. The specialist becomes intensely aware that developments are taking place in understanding the wider implications of the diseases with which he is concerned while he remains out of touch with them. Lack of contact with general medicine and surgery is not, of course, experienced by the physician or surgeon who spends most of his time in a general hospital and visits the special hospital only occasionally, but with the development of the Institutes more and more senior men spend more time within their walls.

The lack of contact with general medicine and surgery was widely felt in the Institutes. No regrouping can entirely remedy this, though it can mitigate it, because after all general medicine is the sum of its component parts. What is notably lacking in each is emergency work, though some acute cases are transferred from general hospitals.

(b) *Limited availability of ancillary skills, interests and techniques*: Some of these special hospitals had no full-time laboratory staff before the University became associated by way of the Institutes. Some remain deficient in this respect. Both the hospitals and the Institutes thus tend to be concerned with applying and perfecting known techniques rather than with developing new ones. On the laboratory and research side, many have only recently satisfied University requirements. They are making brave attempts to catch up with developments that have occurred elsewhere where more whole-time scientific staff have been gathered together and where a wider range of knowledge and skills and of the appropriate apparatus is more readily available.

(c) *Limited range of apparatus and equipment*: The advancement of knowledge nowadays also requires expensive and elaborate apparatus. The more elaborate spectrophotometers, high speed centrifuges, electron microscopes, mass spectrometers and the like may be absolutely essential to the solution of a special aspect of the problem. A team may want to use them for a brief period and no more. These pieces of expensive apparatus, and the skill to use them, are usually available in a University campus and in a medical school with a full range of departments. They are also available in some of the larger institutes, but not in the smaller.

(d) *Limited library facilities* : Many of the institutes have good ranges of their special journals and monographs, but few provide opportunity to consult a wider range of standard works or journals in chemistry, physics, biology or the preclinical sciences.

(e) *Inadequate lecture rooms for large meetings* : The specialist associations often find it impossible to meet in the special hospital or Institute because there is no room large enough or well enough equipped for projection.

(f) *Lack of social amenities and opportunities for relaxation for staff and students* : The kind of facilities provided by staff houses, by student unions, by debating, scientific, political, musical and athletic societies that are so important a feature of modern university life are notably lacking.

The effects of this isolation are plain. The postgraduate hospitals and Institutes are, in general, not now in a position to lead in their specialty. The fundamental contributions to knowledge and the major technical advances have been tending to come in the last quarter century from those working in institutions with wider contacts and greater ranges of technical aids than most of these Institutes possess. One of the greatest advances in cancer was the identification of chemical carcinogens by Kennaway and his colleagues Mayneord (a physicist) and Cook (a chemist) some thirty years ago at what is now the Institute of Cancer Research. It seems inevitable that the dice will be even more heavily loaded against isolation in the future.

Some of the Institutes of the special hospitals represent such new ventures into the University side of medicine that they have all the freshness of youth to those who participate. They have not yet felt the penalties. Those special hospitals with a more ancient academic tradition are well aware of them.

In short, it would seem to us that the special hospitals and Institutes in general can continue on their present sites to do what they have done in the past—to accumulate and transmit clinical expertise in their special subjects. But in most of them the range of contacts and facilities is too small to place them at an advantage in advancing knowledge. They may well apply and perfect, but it will be difficult for them to lead.

CAN THESE DEFECTS BE REMEDIED BY KEEPING THE HOSPITALS AND INSTITUTES WHERE THEY ARE ?

It is at once obvious that some of these defects could be remedied, but at very considerable cost. Each Institute could have a large lecture theatre, large library, a full range of modern and expensive equipment, and a full range of scientific and technical services. But it is doubtful whether such an outlay could be regarded as a justifiable use of public money, or of money devoted to charitable purposes. Moreover, much of what was provided would go unused for long periods, and disuse is as potent a cause of decay in social as in biological organisms.

Even this would only meet part of the need. All whom we consulted were emphatic on the need for closer contact with the disciplines of chemistry, physics, biochemistry, physiology, pharmacology, genetics, biometry and the various branches of pathology. The Royal Marsden and its associated Institute for Cancer Research comes closest to having a full representation of these disciplines. But because no other special disease is quite so catholic as cancer it will be doubtful whether any other Institute can, and will, be so self-contained. And it is noteworthy that, despite its being perhaps the most complete of all the Institutes, the Institute for Cancer Research values its collaboration and exchange of services with the neighbouring Institute of Chest Diseases, and welcomes the larger contacts and facilities that could be made available by the proposed grouping.

In contrast to the special hospitals and their associated Institutes, it is clear that the special units need not suffer all of these same disadvantages. They are usually sited in general hospitals, and need not lack contact with general medicine and surgery. What they inevitably lack is contact with general science because, in the absence of available beds in teaching hospitals to establish such units, they tend to be formed in peripheral hospitals. However, it is common for the abler and more energetic physicians and surgeons of teaching hospitals to advance the subjects of their special interest. The methods now being perfected by the Institute of Cardiology were largely introduced by James Mackenzie and Thomas Lewis of The London and University College Hospitals, and by Cournand and Richards of the Bellevue Hospital in New York.

The ideal arrangement for the development of specialist practice, for training postgraduates and for the advancement of knowledge in the appropriate field must attempt to reconcile these opposing principles, namely to retain what is good from the previous experience of isolation while removing the defects which may prove disastrous in the future. Clearly there is more than one way in which this can be done, and indeed should be done, for in fact fruitful developments depend on the association of compatible personalities and the coming together of different disciplines that no one can foresee. Indeed, as one of those whom we consulted pointed out to us, the essential object of the present exercise is to ensure that no artificial barriers to the exchange of knowledge, as between workers in different disciplines, are created or fostered.

In considering the ideal, we have to take account of the present situation and the events leading up to it. The present situation poses three groups of problems—the future of special units, the future of special hospitals outside London, and the future of the special hospitals and their attached Institutes in London. The last is by far the most complex and will be treated most fully.

III

THE SPECIAL HOSPITALS OF LONDON AND THEIR ATTACHED INSTITUTES

WHAT SHOULD BE PRESERVED

What should be preserved is what might be called the "goodwill" built up over the years by these hospitals and the circumstances on which this goodwill depends.

The hospitals should retain their names and identities, their boards of governors and their method of recruiting their medical staff. Each should have its own wards and operating theatres. If a number of these hospitals were situated close to each other there would be splendid opportunities of sharing certain services, e.g. a blood bank and a central sterile supply department, and the kind of social and recreational amenities that would facilitate the recruitment of nursing and other staff.

We have already pointed out that we do not see how these special hospitals and their attached institutes can achieve, or retain, intellectual leadership in their specialties so long as they remain isolated.

THREE POSSIBLE REMEDIES FOR ISOLATION :

To counter isolation, three possibilities suggest themselves. Each Institute could move to an undergraduate teaching hospital with which it could be associated; some, or all, of the Institutes could move to and be attached to the Postgraduate Medical School at Hammersmith, or they could associate themselves in groups.

The first possibility is not one that, in general, finds favour in the Institutes or with us. (It is possible that association with an undergraduate teaching hospital might provide the best solution for the Eastman Dental Clinic). There would be a grave danger of loss of identity of the special hospital, and there are the complicating factors of more than optimum size, the conflicting duties of undergraduate and postgraduate education, and two boards of governors with conflicting allegiances.

The second possibility carries the same dangers of possible loss of identity and excessive size and again is not a solution that finds favour with those concerned or with us.

There remains the third alternative, which is in fact that made possible by the Minister's statement. What should be the objectives of such an association? We would list them as follows :—

- (a) That the name and identity of the special hospital should be preserved. This had already been considered, and is in no way prejudiced by association.
- (b) That the range of knowledge, interests and skills available in the association should approximate as closely as possible to that found in a complete medical school containing strong science departments.
- (c) That the facilities for interchange and collaboration in the association are such that the divorce from general medicine and surgery is minimized.
- (d) That the choice of sites, and the use of those sites, should bear these considerations in mind.

IV

TOWARDS AN IDEAL ASSOCIATION

To achieve these objectives, we may outline what might be done with such special hospitals and their attached Institutes given no difficulties in site.

THE HOSPITALS :

We would imagine that 4 to 6 special hospitals would be grouped round the periphery of a circle. Each would have its own identity, wards, operating theatres and staff. As already pointed out, there would be splendid opportunities of gaining improved or additional facilities and amenities by sharing.

THE INSTITUTES (SCIENTIFIC DEPARTMENTS):

Approaching the centre would be the research departments peculiar to each specialty, with small seminar rooms, lecture theatres and what would amount to a departmental library peculiar to that specialty. These would represent the beginning of the attached institute. Neighbouring Institutes should communicate with each other at basement and at some higher level. Central to these laboratories and rooms would be such departments as pathology, microbiology, biochemistry, genetics, biometry and medical physics. In the very centre, forming the hub as it were, would be the central library, the large lecture theatre, the department of medical illustration and the animal house serving the group. Social, recreational and refectory arrangements should not be forgotten. The following require further comment :

(a) *The research and other rooms peculiar to the Institute* : Each Institute has in fact a research programme which will grow, and which is, and must remain, orientated particularly to the subject matter of the specialty. The arrangements suggested should make access between the wards and outpatient department of the special hospital, the major laboratory subjects and the main library as easy as possible.

(b) *Pathology, microbiology and biochemistry* : The arrangements for these departments should be made with thought for the special interests of the separate hospitals and Institutes, the advantages of large departments over small, in terms of transfer of information, and interavailability of skills and elaborate and expensive apparatus. Clearly there are several ways in which this object may be achieved, and they will differ with the hospitals, Institutes and men composing them in the association, as well as being modified by the exigencies of the site. The suggestions that follow are mainly based on suggestions made to us during our visit to the Institutes.

The following facilities could be shared or provided in common for all the Institutes of the association, provided that the site allows easy access :—

- (i) A blood bank and its associated special services.
- (ii) A fully equipped postmortem room suite, with arrangements for demonstration.
- (iii) Automated apparatus for biochemical estimations, and its appropriate services.

- (iv) An animal house, fully equipped with an operating theatre, injection and other rooms, and supervised by a fully trained veterinarian or technician. Accommodation for infected animals would probably need to be provided for separately in the Institutes.
- (v) Haematology and serology.
- (vi) Certain aspects of microbiology, e.g. mycology and virology.
- (vii) Cytology.
- (viii) Immunology.
- (ix) Tissue and organ culture.

Separate provision with full research facilities would probably have to be made for each Institute for :—

- (i) Special histopathology.
- (ii) Special microbiology.
- (iii) Special biochemistry.

There would, however, be everything to be said for accommodation in a given discipline for the several Institutes being placed in adjoining rooms so that certain facilities could be shared.

(c) *Genetics and Biometry* : One Institute in each of the two groups already has departments of genetics and biometry. They could become the stimulus nuclei around which work in the other specialties of the group would develop.

(d) *Medical Physics* : Medical physics is a strong department in one Institute and, together with the department of radiotherapy, provides the following services which are quite essential to contemporary science :—

- (i) An opportunity for discussing elementary physical principles.
- (ii) The design of apparatus and assistance in developing prototypes.
- (iii) Advice and assistance on the use of modern technological advances, e.g. television, telemetry.
- (iv) The use of radio-isotopes and protection against radiation hazard.
- (v) Special services to radiotherapy and diagnostic radiology.

It should be remarked that one of the major opportunities for spectacular advances in science in the foreseeable future is the boundary between physics and biology. Departments of medical physics thus have an exceptional opportunity of developing profitable lines of research of their own. Their function is not solely that of being host to other departments' parasites.

(e) *Endocrinology* : Endocrinology is of increasing importance in biology and medicine. It is not well developed in this country and, demanding as it does an intimate acquaintance with certain types of disease, chemistry, histology and animal experimentation, it is unlikely that every Institute can have even an adequate—much less a distinguished—department. Each group of Institutes, however, could have such a department. Here again is an opportunity for developing one first-class department to serve the whole.

(f) *Metabolism Ward* : This is a necessary adjunct to endocrinology, and can usefully be associated physically with that department. It is an expensive item to run, but one which is indispensable for those interested in the bio-chemistry of disease. One would suffice for a group.

(g) *Elaborate Instruments* : Modern technology introduces elaborate instruments which may initially cost upwards of £20,000, which may require specially skilled operation and special housing, and which are capable of meeting the needs of several disciplines.

CENTRAL DEPARTMENTS :

The following might be provided at the centre:—

(a) *A Central Library* : The central library would provide a fairly full range of journals, monographs and text books relating to general science, the preclinical sciences, pathology, general medicine and surgery, and would also provide a fuller range in the specialties of the Institutes. Departmental libraries would be restricted in scope to texts and journals consulted frequently.

The central library would provide alcoves where those writing papers could keep collections of journals on which they are working. The central catalogue would include collections in the Institutes. The trained library staff would provide advice in seeking past publications, in providing and checking lists of references, quotations, etc. Facilities for copying and microfilming would be available. In short, the work of scholarship would be assisted and graduates from Universities which are less fortunately placed would learn the functions and methods of a skilled library service.

(b) *The large lecture theatre* needs no further comment.

(c) *The central animal house* has already been noted. A central house would not only provide skilled supervision and a wide range of technical facilities for animal work. It would also facilitate the supply and breeding of pure strains and of pathogen-free animals that are necessary for certain kinds of experiment.

(d) *A department of medical illustration* : Most Institutes have such departments already. They are essential to the transfer of knowledge through lectures or publications. A central department could be under the charge of a medical man whose metier is the use of these media. Such a department could co-operate in cinematography in all its forms, including talkies, time lapse cinematography and the recording of other sorts of data.

(e) *Social amenities* : In addition to common rooms for staff and students and nurses, certain recreational facilities like tennis and squash courts and perhaps a swimming bath would be a much more justifiable expenditure for a group of hospitals and Institutes than for an individual. Residential accommodation for hospital staff and postgraduate students becomes daily more urgent, particularly in London. The educational advantages to be derived from these have already been mentioned.

V

THE EFFECTS OF SUCH AN ARRANGEMENT

We believe that such an arrangement would preserve the essential advantages inherited by the special hospitals and Institutes while removing many of the disadvantages. In particular, the individualities of the hospitals would be preserved while their scientific departments would be presented with many of the advantages that they would have got by being more closely associated with the general sciences and with general medicine and surgery. Thus, physics and chemistry will be represented in the departments of medical physics and biochemistry. The more relevant aspects of biology are genetics and biometry. Clinical research now uses the methods developed by biochemistry and physiology. Some of the most important work on the physiology of the eye, the ear, the circulation, respiration, the nervous system, etc. is being carried out at the Institutes. Their close spatial association could not but stimulate this work, in particular the territory between disciplines where much the greatest opportunity lies.

PRACTICAL DIFFICULTIES IN ACHIEVING THE IDEAL

(a) *Geography* : The chief obstacle to the achievement of these ideal arrangements is geography, including the existing arrangement of buildings and roads. Although, as will be shown, the South Kensington site is capable of development, the actuality must depart to some extent from the plan we have outlined.

(i) *The South Kensington group* provides the most favourable situation, for here at least is the possibility of a continuous site, though broken by main roads that cannot be closed. Every effort should be made in this instance to plan the hospitals and Institutes so that the objectives of the arrangement already outlined can be achieved. Perhaps the most encouraging aspect of this group is that the proposed members welcome association and at least in pathology have begun to plan how they may exploit its advantages. The future of this group is enormously enhanced by the collaboration and interchange of facilities already begun by the Institutes of Cancer Research and of Chest Diseases, separated though they are by the Fulham Road.

(ii) *The Holborn group* provides a more difficult problem. We are not asked to make detailed suggestions, but we make two comments. First, a distance of half a mile in the centre of London makes the joint use of facilities such as we have suggested quite impracticable. The island site occupied jointly by the Institutes of Neurology and Child Health could, and should, develop common facilities forthwith.

(b) *Attitude of mind* : The several Institutes of the Federation present very different attitudes of mind towards the future. The differences depend on history, on the possibility of solving certain problems on a short term basis as well as on personal preference.

We understand and appreciate these differences. However, we have been asked to comment on the principles involved. Naturally we have to take a long term view. The short term view is to make each Institute as self-sufficient as possible. Our doubt is whether in the long term this will prove good enough to keep these institutions in the van of medical advance and, ultimately, practice.

VI

SPECIAL HOSPITALS OUTSIDE LONDON

In general, as we have seen, these special hospitals form part of a teaching hospital group, providing homes for the relevant clinical departments of the University and facilities for undergraduate as well as postgraduate education. Their main defect is position. Often they are too remote from the general hospital and from the main University buildings and medical schools to realise the objectives already set out. This is very generally realised. It is to be hoped, and indeed expected, that in the fullness of time they will be rebuilt on a site close enough to allow them to form an integral part of the whole complex of the medical school and University.

Special Units

As we have seen, these were in the main arranged as service units, and they were sited with the needs of an area in mind at hospitals on the periphery of cities or in the country where ground or surplus buildings allowed. They were developed, and will be developed, primarily for patient care. They suffer from many of the disadvantages of the special hospitals already outlined, particularly in their separation from general science and the other aspects of university life. They are also necessarily much smaller in size, and they inevitably must tend to use skills developed elsewhere. However, they too have come to play an important part in the education of specialists, largely by providing training posts, and have played their part in the development of their subject.

If, as is hoped, postgraduate education is organized on a regional basis, catering not only for trainees but also for general practitioners and indeed all doctors, these special units have an important role to play. On a smaller scale, they provide the kind of expertise that the special hospitals have pioneered. But they have the great opportunity of carrying this to parts remote from the University influence. It seems likely that postgraduate education in the regions will be based on those hospitals which preserve and foster that attitude of curiosity and enquiry which is sometimes called the educational atmosphere. In providing and nurturing this, the special units have an important part to play.

Competition is of value in that it prevents self-satisfaction and promotes the urge to excel. The friendly rivalry between the older special hospitals and the newer special units may serve to keep both alert and adventurous.

In this report we have not tried to set out those arrangements that we think might be quite ideal for medical education in the specialties in the remote future. Two reasons have dictated this : the first reason is that ideal arrangements are concerned with communities and individuals who, in fact, make them work—or otherwise. The second reason is that the present inevitably has to build upon the past. Ideals that can not be realised are of limited interest.

As we see it, new specialties will develop in the centres of scientific research wherever they may be, but particularly in the universities and their associated teaching hospitals. Thus will specialties be born and, in the large part, developed. What we have chiefly been concerned with in this report is to consider how the existing special hospitals and special units might develop and play their full part in the future, not only in advancing their subject but in educating future specialists from home and abroad.



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